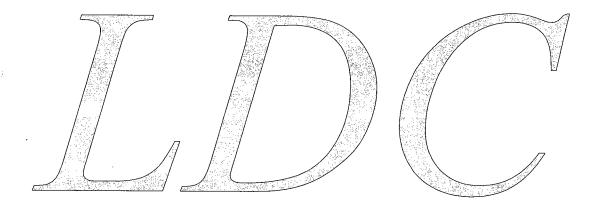
NASA JPL Data Validation Reports LDC# 10006

Chromium



Laboratory Data Consultants, Inc. Data Validation Report

Project/Site Name:

NASA JPL

Collection Date:

January 29 through February 3, 2003

LDC Report Date:

March 28, 2003

Matrix:

Water

Parameters:

Chromium

Validation Level:

EPA Level III

Laboratory:

Advanced Technology Laboratories

Sample Delivery Group (SDG): 03-1425

Sample Identification

MW-21-5

MW-20-3MS

MW-21-4

MW-20-3MSD

MW-21-3

MW-20-3DUP

MW-21-2

DUPE-2-IQ03DUP

MW-21-1

VIV V-Z-1-1

EB-1-1/29/03

MW-20-5

MW-20-4

MW-20-3

MW-20-2

1414/ 00 4

MW-20-1

EB-2-1/30/03

DUPE-1-IQ03

MW-19-5

MW-19-4

MW-19-3

MW-19-2

MW-19-1

EB-3-2/3/03

DUPE-2-IQ03

Introduction

This data review covers 24 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 200.8 for Chromium.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994) as there are no current guidelines for the methods stated above.

A table summarizing all data qualification flags is provided at the end of this report. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from specified protocols or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

- U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.
- J Indicates an estimated value.
- R Quality control indicates the data is not usable.
- N Presumptive evidence of presence of the constituent.
- UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.
- A Indicates the finding is based upon technical validation criteria.
- P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable.

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB1 (prep blank)	Chromium	0.213 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-5 MW-19-4 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
ICB/CCB1	Chromium	0.315 ug/L	MW-21-5 MW-21-4 MW-21-3 MW-21-2 MW-21-1 EB-1-1/29/03 MW-20-5 MW-20-4 MW-20-2 MW-20-1 EB-2-1/30/03 DUPE-1-IQ03 MW-19-5 MW-19-5 MW-19-3 MW-19-2 MW-19-1 EB-3-2/3/03 DUPE-2-IQ03
PB2 (prep blank)	Chromium	0.381 ug/L	MW-20-3
ICB/CCB2	Chromium	0.376 ug/L	MW-20-3

Sample concentrations were compared to the maximum contaminant concentrations detected in the ICB/CCB/PBs. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
MW-20-3	Chromium	1.7 ug/L	1.7U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

ICP interference check was not required by the method.

V. Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution was not required by the method.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

Data flags have been summarized at the end of this report.

XIII. Field Duplicates

Samples MW-20-1 and DUPE-1-IQ03 and samples MW-19-4 and DUPE-2-IQ03 were identified as field duplicates. No chromium was detected in any of the samples with the following exceptions:

	Concent	Concentration (ug/L)			
Analyte	MW-20-1	DUPE-1-IQ03	RPD		
Chromium	2.8	2.5	11		

	Concent		
Analyte	MW-19-4	DUPE-2-IQ03	RPD
Chromium	2.3	1.9	19

XIV. Field Blanks

Samples EB-1-1/29/03, EB-2-1/30/03 and EB-3-2/3/03 were identified as equipment blanks. No chromium contaminants were found in these blanks.

NASA JPL

Chromium - Data Qualification Summary - SDG 03-1425

No Sample Data Qualified in this SDG

NASA JPL

Chromium - Laboratory Blank Data Qualification Summary - SDG 03-1425

SDG	Sample	Analyte	Modified Final Concentration	A or P
03-1425	MW-20-3	Chromium	1.7U ug/L	А

Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-21-5

Lab Order:

061277

JPL

Collection Date: 1/29/2003 8:40:00 AM

Project: Lab ID:

061277-001A

Matrix: WATER

Analyses	Result	Limit Qual Ur	uits DF	Date Analyzed
ICP-MS METALS		FΡΔ	200.8	1
RunID: ICP4_030217A	QC Batch: R25	5095	200.0	Analyst: RQ
Chromium	5.7	1.0 µg/	'L 1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

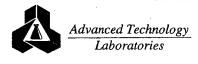
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified



Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

061277

Lab Order: **Project:** Lab ID:

JPL

061277-002A

Client Sample ID: MW-21-4

Collection Date: 1/29/2003 9:15:00 AM

Matrix: WATER

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
ICP-MS METALS					
			EPA 200.8		•
RunID: ICP4_030217A	QC Batch: R25	095			Analyst: RQ
Chromium	4.7	1.0	μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

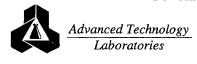
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified





Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-21-3

Lab Order:

061277

Project: Lab ID:

JPL

061277-003A

Collection Date: 1/29/2003 12:45:00 PM

Matrix: WATER

Analyses	Resul	lt Limit (Qual Units	DF	Date Analyzed
ICP-MS METALS					
			EPA 200.8		
RunID: ICP4_030217A	QC Batch:	R25095			Analyst: RQ
Chromium	5.9	9 1.0	ug/L	1	2/17/2003

Qualifiers:

Laboratories

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

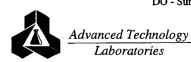
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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4 of 23

Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-21-2

Lab Order:

061277

JPL

Collection Date: 1/29/2003 1:20:00 PM

Project: Lab ID:

061277-004A

Matrix: WATER

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
ICP-MS METALS		į			
			EPA 200.8		
RunID: ICP4_030217A	QC Batch: R25	095			Analyst: RQ
Chromium	6.7	. 10	ua/l	1	2/17/2002

Qualifiers:

ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified



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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-21-1

Lab Order:

061277

Project:

JPL

Collection Date: 1/29/2003 2:00:00 PM

Lab ID:

061277-005A

Matrix: WATER

Analyses	Result	Limit (Qual Units	DF	Date Analyzed
ICP-MS METALS			EPA 200.8		,
RunID: ICP4_030217A	QC Batch:	R25095			Analyst: RQ
Chromium	4.6	1.0	μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified



Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: EB-1-1/29/03

Lab Order:

Project:

Lab ID:

Chromium

061277

JPL

061277-006A

Collection Date: 1/29/2003 2:10:00 PM

Matrix: WATER

Result Limit Qual Units DF **Date Analyzed** Analyses **ICP-MS METALS EPA 200.8** QC Batch: R25095 Analyst: RQ ICP4_030217A RunID: 2/17/2003 ND 1.0 μg/L

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

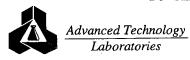
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-20-5

Lab Order:

061277

Project:

JPL

Collection Date: 1/30/2003 8:25:00 AM

Lab ID:

061277-007A

Matrix: WATER

Analyses	Resul	t Limit (Qual Units	DF	Date Analyzed
ICP-MS METALS					
•			EPA 200.8		
RunID: ICP4_030217A	QC Batch:	R25095			Analyst: RQ
Chromium	2.7	7 1.0	μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

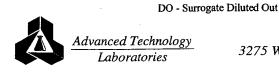
H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

Results are wet unless otherwise specified

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Lab Order:

061277

Project:

JPL

Lab ID:

Analyses

061277-008A

Client Sample ID: MW-20-4

Collection Date: 1/30/2003 9:25:00 AM

Matrix: WATER

ICP-MS METALS

ICP4 030217A

Limit Qual Units

DF

Date Analyzed

EPA 200.8

QC Batch: R25095

Result

Analyst: RQ

Chromium

RunID:

2.4

1.0

μg/L

2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

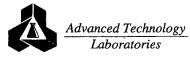
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-20-3

Lab Order:

061277

JPL

Collection Date: 1/30/2003 10:55:00 AM

Project: Lab ID:

061277-009A

Matrix: WATER

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed	
ICP-MS METALS			EPA 200.8	į		
RunID: ICP4_030224A	QC Batch: R25	311			Analyst: RQ	
Chromium	1.7	1.0	μg/L	1	2/24/2003	U

Qualifiers:

ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

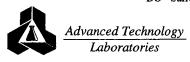
H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

E - Value above quantitation range Results are wet unless otherwise specified

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-20-2

Lab Order:

061277

JPL

Collection Date: 1/30/2003 11:40:00 AM

Project: Lab ID:

061277-010A

Matrix: WATER

Analyses	Result	Limit Qual Units	DF	Date Analyzed
ICP-MS METALS				
		EPA 200.8		
RunID: ICP4_030217A	QC Batch: R25	095		Analyst: RQ
Chromium	2.2	1.0 μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

S - Spike/Surrogate outside of limits due to matrix interferen

J - Analyte detected below quantitation limits

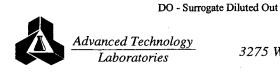
H - Sample exceeded analytical holding time

B - Analyte detected in the associated Method Blank

E - Value above quantitation range

Results are wet unless otherwise specified

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CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-20-1

Lab Order:

061277

Project:

JPL

Collection Date: 1/30/2003 1:00:00 PM

Lab ID:

061277-011A

Matrix: WATER

Date: 25-Feb-03

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
ICP-MS METALS					
			EPA 200.8		
RunID: ICP4_030217A	QC Batch: R	25095			Analyst: RQ
Chromium	2.8	1.0	μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

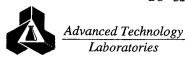
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: EB-2-1/30/03

Lab Order:

061277

Project:

JPL

Collection Date: 1/30/2003 1:40:00 PM

Lab ID:

061277-012A

Matrix: WATER

Analyses	Result	Limit Qual Units	DF	Date Analyzed
ICP-MS METALS	1	EPA 200.8		
RunID: ICP4_030217A	QC Batch: R25	095		Analyst: RQ
Chromium	ND	1.0 μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

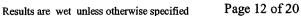
B - Analyte detected in the associated Method Blank

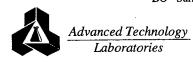
DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range





061277-013A

Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: Dupe-1-IQ03

Lab Order:

061277

Collection Date:

Project: Lab ID:

Analyses

ЉL

Matrix: WATER

DF

ICP-MS METALS

EPA 200.8

RunID: ICP4_030217A

QC Batch:

R25095

Limit Qual Units

Analyst: RQ

Date Analyzed

Chromium

2.5

Result

1.0

µg/L

2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

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14 of 23

Fax: 562 989-4040

Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-19-5

Lab Order:

061277

Project:

JPL

Collection Date: 2/3/2003 8:10:00 AM

Lab ID:

061277-014A

Matrix: WATER

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
ICP-MS METALS			EPA 200.8		1
RunID: ICP4_030217A	QC Batch: R25	095	2.7.2000		Analyst: RQ
Chromium	3.4	1.0	μg/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

H - Sample exceeded analytical holding time

S - Spike/Surrogate outside of limits due to matrix interferen

024

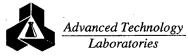
B - Analyte detected in the associated Method Blank

E - Value above quantitation range

DO - Surrogate Diluted Out

Results are wet unless otherwise specified





CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-19-4

Lab Order:

061277

Project: Lab ID:

JPL

061277-015A

Collection Date: 2/3/2003 9:20:00 AM

Matrix: WATER

Date: 25-Feb-03

Analyses Result Limit Qual Units DF **Date Analyzed ICP-MS METALS EPA 200.8** RunID: ICP4_030217A QC Batch: Analyst: RQ 2.3 Chromium 1.0 μg/L 1 2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

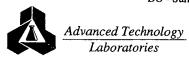
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

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Date: 25-Feb-03

CLIENT: Lab Order: Applied P & Ch Laboratories

061277

Project; Lab ID:

JPL

061277-016A

Client Sample ID: MW-19-3

Collection Date: 2/3/2003 11:05:00 AM

Matrix: WATER

Analyses

Chromium

Result

Limit Qual Units

DF

Date Analyzed

ICP-MS METALS

RunID: ICP4_030217A QC Batch:

R25095

5.1

1.0

μg/L

EPA 200.8

Analyst: RQ 2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

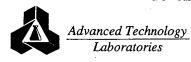
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: MW-19-2

Lab Order:

061277

JPL

Collection Date: 2/3/2003 10:20:00 AM

Project: Lab ID:

061277-017A

Matrix: WATER

Analyses	Result	Limit Q	ual Units	DF	Date Analyzed
ICP-MS METALS		ī	EPA 200.8		
RunID: ICP4_030217A	QC Batch: R25	095			Analyst: RQ
Chromium	6.0	1.0	μg/L	1	2/17/2003

1-18/07

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

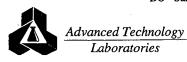
H - Sample exceeded analytical holding time

E - Value above quantitation range

027

Results are wet unless otherwise specified

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Date: 25-Feb-03

CLIENT: Lab Order: Applied P & Ch Laboratories

061277

Project:

JPL

Lab ID:

Analyses

061277-018A

Client Sample ID: MW-19-1

Collection Date: 2/3/2003 11:45:00 AM

Matrix: WATER

Result

Limit Qual Units

DF

Date Analyzed

ICP-MS METALS

RunID: ICP4_030217A

QC Batch:

R25095

EPA 200.8

Analyst: RQ

Chromium

2.6

1.0

μg/L

2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

028

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Date: 25-Feb-03

CLIENT:

Applied P & Ch Laboratories

Client Sample ID: EB-3-2/3/03

Lab Order:

061277

Project:

JPL

Collection Date: 2/3/2003 9:25:00 AM

Lab ID:

061277-019A

Matrix: WATER

Analyses	Result	Limit Qual Units	DF	Date Analyzed
ICP-MS METALS				
		EPA 200.8		
RunID: ICP4_030217A	QC Batch: R25	095		Analyst: RQ
Chromium	ND	1.0 ua/L	1	2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

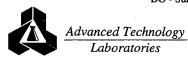
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

Results are wet unless otherwise specified

E - Value above quantitation range

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Date: 25-Feb-03

CLIENT: Lab Order: Applied P & Ch Laboratories

061277

Project:

JPL

Lab ID:

061277-020A

Collection Date:

Matrix: WATER

Client Sample ID: Dupe-2-IQ03

Analyses

Chromium

Result

Limit Qual Units

DF

Date Analyzed

ICP-MS METALS

RunID: ICP4_030217A

QC Batch:

R25095

1.0

μg/L

EPA 200.8

Analyst: RQ 2/17/2003

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

B - Analyte detected in the associated Method Blank

DO - Surrogate Diluted Out

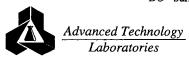
S - Spike/Surrogate outside of limits due to matrix interferen

H - Sample exceeded analytical holding time

E - Value above quantitation range

Results are wet unless otherwise specified

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	6#: <u>03-1425</u>	 			Lev	el III					Page: 1 c	 of
	oratory: <u>Advanced Techn</u> Chrom: um 'HOD: Metals (EPA SW				20	ల. క	3	M. E	•	:	Reviewer:_ <u>M</u> 2nd Reviewer:_ <u>M</u>	
The valid	samples listed below wer ation findings worksheets	re revi s.	ewed for ea	ch of the fo	ollov	ving \	validation	ı areas. V	alidati	on findings	are noted in atta	che
<u> </u>	Validation	n Area							Comn	nents		-
1.	Technical holding times			Α	San	npling	dates:				2-3-03	
11.	Calibration			A						0		
III.	Blanks			SW								
IV.	ICP Interference Check Sa	mple (I	CS) Analysis	7		Not	t requ	uired				
V.	Matrix Spike Analysis	-		Α			U					
VI.	Duplicate Sample Analysis		·····	Α								
VII	Laboratory Control Sample	s (LCS))	A		L	CS					
VIII	. Internal Standard (ICP-MS))		NA		440	t vev	iewed	1	16		
IX.	Furnace Atomic Absorption	1 QC		N		No.	t util	lized	-			
<u>x.</u>	ICP Serial Dilution			N		No	t re	quire	1			
XI.	Sample Result Verification			N								
XII.	Overall Assessment of Data	а		Α								
XIII	Field Duplicates			sw	t)=	1+13	, D=	15+2	90		
XIV	Field Blanks			ND	Ε	B =	6.12	. 19				
Note: /alida	A = Acceptable N = Not provided/applicable SW = See worksheet ted Samples:	e	ND = No R = Rins FB = Fie		dete	ected	TE	= Duplicate 3 = Trip blan 3 = Equipme		k		
1 /	MW-21-5 W	11 [MW-20-1		W	212	MW-20-31	MS	w/	31		
2	MW-21-4		EB-2-1/30/03		1		MW-20-3		<u></u>	32		\dashv
3 l	MW-21-3	1	DUPE-1-IQ03				MW-20-31			33		
4]	MW-21-2	14	MW-19-5			24	1 _			34		
5 [MW-21-1	15	MW-19-4			25 2				35		
6	EB-1-1/29/03	16	MW-19-3			26 1	Dupe-	2-IQ03	DUP	36		$\neg $
7	MW-20-5	17 [MW-19-2			27				37		
8	MW-20-4	18]	MW-19-1			28				38		
92	MW-20-3	19	EB-3-2/3/03			29				39		\neg
10	MW-20-2	20	DUPE-2-IQ03		V	30				40		\exists
lotes	:											

VALIDATION COMPLETENESS WORKSHEET

Date: 3-27-03

LDC #: 10006B4

LDC #: [000684 SDG #: 03 - 1435 METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Sample Concentration units, unless otherwise noted: 24

VALIDATION FINDINGS WORKSHEET PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: NA Associated Samples:

Page: 1 of Reviewer: MG

| Page: 1 of MG
| Reviewer: MM
| Sample Identification | Sample Identificatio ପ୍ର g 8 Σg 돌 S As 쬢 8 ਲ ប 8 æ 뿟 Ą ş 5 ₽ ₹ Z В ¥ F > ۵ Blank Action Limit 1.575 Maximum ICB/CCB* (ug/L) 0.315 Maximum 0.313 (ng/L) **8**8 Analyte Maximum (mg/Kg) <u>8</u> Ba S 8 ξ Ē 뿔 Zu ŝ å ပ္ပ ပ္ပ 5 Se Αg å As Ö E. ź

| Samples with analyte concentrations within five limes the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

Analyte Maximum

(mg/Kg) <u>.</u>

Sp

Ba Be $_{\rm S}$ ပ္မ

LDC #: [000684 SDG #: 03 - 1435 METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES
Soil preparation factor applied: NA

Page: 1 of 1 Reviewer: MG 2nd Reviewer: 14W 8 ပ္လ ğ Ē g As g 8 8 훈 ₹ Ö 5 ው ይ Ą Z გ å ¥ Sample Identification 0 Associated Samples: 7 9 Sample Concentration units, unless otherwise noted: 1.905 Blank Action Limit Maximum ICB/CCB* 0.376 (ng/L) Maximum PB* (T/6n) 0.381

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B

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

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LDC #: 10006 B4 SDG #: 03-1425

VALIDATION FINDINGS WORKSHEET <u>Field Duplicates</u>

Page:	of
Reviewer:_	MG
nd reviewer:	MW

METHOD: Inorganics, Method ________

<u>Øn n/a</u> <u>Y</u>n n/a

Were field duplicate pairs identified in this SDG?

Were target analytes detected in the field duplicate pairs?

Concentration (Mg/L)				
	13	RPD (Limit)	Difference (Limit)	Qualifier
2.8	2.5	(1)		
, , , , , , , , , , , , , , , , , , , ,				
	 			
		11 13	11 13 RPD (Limit)	RPD (Limit) Difference (Limit)

	Concentration ("g/L)				
Analyte	15	20	RPD (Limit)	Difference (Limit)	Qualifier
Cr	2.3	1.9	19		
					
					-

	Concentration ()	· ·		
Analyte			RPD (Limit)	Difference (Limit)	Qualifier
·					
					

	Concentration ()	RPD (Limit)	Difference (Limit)	Ounlistian
Analyte			(Limit)	Difference (Elimit)	Qualifier
					7
					
		ľ			